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ABSTRACT

The role of education in preparing young people to face the demands of the 21st century is the focus of this final report of a round table and symposium. The report of the round table focuses on formulating a philosophy of education for the 21st century, the increasing globalization of the world, and the development of a new view of learning for the 21st century. The report of the symposium describes more specific qualitative dimensions of the future of education including cultural, moral and ethical issues, science and technology, communication, and the world of work. Addresses made by conference officials and a list of participants are contained in annexes. (DB)

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UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

International Symposium and Round Table

Qualities Required of Education Today to Meet Foreseeable Demands in the Twenty-First Century
(Beijing, People's Republic of China
27 November - 2 December 1989)

FINAL REPORT

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I. INTRODUCTION

A. Background and Objectives

1. Background

1. In conformity with the decisions taken at the twenty-fourth General Conference, Unesco organized from 28 November - 2 December 1989 in Beijing, People's Republic of China, an International Symposium and Round Table on the theme "Qualities Required of Education Today to Meet Foreseeable Demands in the Twenty-First Century".

2. The decision was taken in response to world-wide debates intensified among Member States on the re-orientation and vitalization of education with a view to preparing young people for the twenty-first century, in order for them to effectively meet challenges of the new century in a world even more complex and interdependent and facing rapid scientific and technological innovation, an ever increasing production of information and knowledge and serious deterioration of the environment.

3. For the last four decades, Unesco has played a leading role in stimulating and promoting the reflections and debates on the future of education. The report "Learning to be" (1972) by the International Commission on the Development of Education exerted a world-wide debate on educational philosophy and practices and its basic concepts of lifelong education and of a learning society have been widely recognized and put into practice. In 1980 Unesco organized an International Symposium on the Evolution of the Content of General Education Over the Next Two Decades, which invited education specialists from all regions of the world in order to debate the essential features of the organization of educational contents, such as the relevance of educational contents, its balance and interdisciplinarity. Moreover, Unesco has recently carried out international comparative studies on the trends and innovations of curriculum reforms, the synthetic results of which were published in a book "The Contents of Education: A World View of their Development from the Present to the Year 2000" (1987).

2. Objectives of the Symposium and Round Table

The main objectives of the Round Table were to propose major long-term goals and orientation of education from a multidisciplinary point of view, and to identify its more dynamic roles in order to prepare young people to effectively meet the challenges and foreseeable socio-economic, socio-cultural and scientific and technological developments in the twenty-first century.

Given the role of education to help young people for life in the twenty-first century, the main objectives of the Symposium was to identify and clarify more specific qualitative dimensions required in vitalizing and renovating education, covering educational implications of ethical and moral issues, science and technological developments, communication and information and communication technology and the challenge of the future in the world of work.

3. Expected follow-up

The results of the Symposium and Round Table will be widely disseminated to Member States and to all those concerned in order to stimulate debates and discussions on the future of education towards the twenty-first century.

The International Symposium and Round Table will serve as a starting point for other Unesco programmes and activities which are expected to examine various dimensions and aspects of the quality and future of education.

It will also be followed by a series of meetings in the next few years, whose main concern will also be the quality of education.

The International Congress: Planning and Management of Educational Development (March 1990, Mexico) and the World Conference on Education for All - Meeting Basic Learning Needs, to be held in 1990, will deal with providing good quality primary schooling for all children around the world and literacy linked with life skills for adults to enable them to cope with the demands of the modern world. The special theme of the 42nd session of the International Conference on Education (ICE) will be literacy education, as a contribution to the International Literacy Year (1990). Two regional Conferences of Ministers of Education and those Responsible for Economic Planning in Africa (MINEDAF) and in the Arab States (MINEDARAB), and the fourth session of the Intergovernmental Regional Committee for the Major Project in the Field of Education in Latin America and the Caribbean (PROMEDLAC) will also be held during 1990-1991.

The results of the Symposium and Round Table will be taken into consideration in the implementation of Unesco's programme under the Third Medium-Term Plan (1990-1995), particularly in Major Programme Area I, Education and the Future, after its adoption by the twenty-fifth session of the Unesco General Conference (October-November 1989), particularly in its Programme I.2, Education for the Twenty-First Century. The results of the meeting will be fully examined and utilized when executing activities particularly related to the humanistic, cultural and international dimensions of education, the quality of life, the world of work and the promotion of science and technology education.

The overall results of these meetings and activities in this field are to stimulate the reflection of Member States and their institutions on the future of education when devising plans and strategies for renovating the education systems and practices in the years to come.

LEARNING TO CARE: EDUCATION FOR THE TWENTY-FIRST CENTURY

REPORT OF THE ROUND TABLE

INTRODUCTION

In the 1890s a phenomenon called "end of century thinking" commenced. People started to think, write, and talk about the nature of the coming twentieth century. In the last two months of the 1980s, and as the world enters the 1990s, our thoughts will likewise go forward towards the twenty-first century. We should now begin to articulate the kind of world we would like to create in the twenty-first century, and to set about creating as much of it as we can. While there are many aspects of the future we cannot predict, there is still much of it we can realise, if we seek to do so.

All too often in the past, education systems throughout the world have been followers of trends, rather than creators of them. Now education must lead rather than respond to change, and play a major role in helping to mould a preferred twenty-first century.

The world has never changed so rapidly. Beginning in the 1950s a series of technological revolutions commenced. Three of these now exist. These are based on the technologies of the silicon chip which has generated the information revolution, the manipulation of the DNA molecule which has created the biotechnology revolution, and the creation of new advanced industrial materials. There is no reason not to think that these three will not be joined by others in the 1990s.

On the threshold of the twenty-first century, we are more aware than ever that our intellectual achievements and the education systems which support them are interdependent. An education system which is not protected and nurtured by society, will fail to protect and nurture society itself.

Increasingly, wealth and prosperity are dependent on knowledge and skill. Developed countries have never been so creative and innovative. They are deluging the world with new products and services based on their brain-power and creativity. Their economic prosperity is based on the utilisation of intellectual property and resources in the arts, the sciences and the technologies, and through the development of highly skilled and continually learning workforces. These countries now recognise that investment in the education of their people is the best way to ensure greater economic prosperity in the future.

Increasingly other countries are following the same development model. In this model, economic success will be achieved by countries which develop systems of lifelong education, combined with career-path planning. The desire of developing countries to purchase significant quantities of advanced technology-based products and services from developed countries has been a significant cause of their increased indebtedness. Many of these countries now also realise that they too must join the knowledge-based industrial world if they are to thrive economically. Therefore the education systems of all countries have never been more critical for their economic prosperity.

The world is becoming smaller. It is partly being caused by increased trade interdependence and internationalisation of individual economies. New regional groups with common economic arrangements are being formed. This regionalisation is being driven by economic forces and by increased interaction of patterns of trade, investment and tourism, and by the transfer of technology.

The world is also facing a new series of threats. It is now recognising that it is now facing some serious ecological problems, which could seriously risk survival on the earth as we know it. Issues such as climatic change, ozone depletion, acid rain, radio-isotope contamination from nuclear power plants, water pollution, land degradation, the rapid extinction of plant and animal species, and forest depletion are all forcing us to begin to review the very ways we conduct life on the earth. World population is increasing at alarming rates, while urbanisation and related patterns of social disintegration are threatening the economies and societies of third-world countries.

Still there are reasons to hope that things can be better. The unexpected end of the Cold War between East and West is leading to the possibility that the 1990s could be a decade of increased co-operation and demilitarisation. .There exists the possibility of directing the resources now devoted to military budgets in the 1990s to deal with other pressing global issues, including third-world debt, population management, preventing international drug smuggling, increasing world literacy, and dealing with urgent environmental problems. There are reasons to be hopeful. However, this opportunity which is at hand, may be the last chance we have to find meaningful solutions.

The basic issues relating to equity in the world still remain. Disparities in economic prosperity continue to widen between rich and poor nations, human rights continue to be abused, and in some cases even advancements gained in the 1970s have been lost in the 1980s. Two examples of these lost gains relate to the achievement of improvements in global literacy, and continued improvements in the rights and status of women. We therefore must rededicate ourselves to utilizing the education systems of the world to maximise the opportunities of economically disadvantaged individuals, groups, and nations for improving their relative socio economic positions.

Education planners now need to address these and other issues. They need to restructure education to fit people for the twenty-first century, which now will probably be rather different to what we would have predicted as recently as five years ago.

We now need to describe some of the aspects we envisage for a desirable education system which will better fit all people, not just some people, to be active participants in creating a more equitable, fairer and more liveable world in the twenty-first century.

These problems will only be addressed if we become more caring. We need to pay attention to many aspects of caring including:

- Caring for oneself, including one's health.
- Caring for one's family, friends, and peers.
- Caring for other people.
- Caring for the social, economic and ecological welfare of one's society and nation.
- Caring for human rights.
- Caring for other species.
- Caring for the liveability of the earth.
- Caring for truth, knowledge, and learning.

The drive towards industrialisation has led to the end of the extended family in many parts of the world. In many places now,the nuclear family is also under threat. Many people increasingly appear to be motivated by individual advancement at the expense of others, they

are increasingly showing less interest in the acceptance of responsibility for the welfare of, and in giving service to the community at large. A return to some of the values of caring, characteristic of earlier times, is needed. Many indigenous cultures have values and myths which promote caring, including caring for the earth which has nourished them. We could do well to learn more from these cultures which have lost so much because of the lack of caring and respect which conquerors from other cultures have had for them. The remainder of this report will address some of these issues, including those associated with creating a more caring humanity in the twenty first century.

In addressing these problems we will consider three basic subject areas.

1. A PHILOSOPHY OF EDUCATION FOR THE TWENTY-FIRST CENTURY

We need a new philosophy of education appropriate for the twenty-first century. This will include a new epistemology of knowledge and learning, a new code of ethics appropriate for the twenty-first century, and a new political and economic approach in which to site education for the twenty-first century.

The new epistemology of knowledge and learning needs to include:

(a) a new view of knowledge. Education systems throughout the world have emphasized the view of knowledge, which is rationalist. Intuitive approaches have been largely ignored. In addition, traditional approaches to knowledge, which are characteristic of other cultures, have been neglected. Just as the West is rediscovering non-Western approaches, these same values often continue to be degraded in the developing countries in which they originated. We must take a much more multi-cultural view of knowledge. The world has increasingly become enraptured by the logical and positivist approach of science. Truth is often now defined in terms of verifiable scientific truth. This has lead to a downgrading of respect for systems of knowledge which are not based on the dominant Western scientific approach. The education system needs to promote areas of knowledge which are derived from other approaches, but which have also been of undeniable benefit to humanity.

(b) a greater integration of knowledge. Our education system has suffered from the increased fragmentation of knowledge into often meaningless and irrelevant units. We need a new approach to knowledge which is more integrated. This integrated approach can probably best be realised by focussing knowledge on seeking the solutions to real problems which face us at all levels from the local to the global.

(c) a renewed commitment to lifelong learning, combined where possible with career-path planning.

(d) an education system with the following shifts of emphasis:

- A change from education for conformity, to education to promote creativity and innovativeness.

- A change from promoting competitiveness, to promoting co-operativeness. This is part of the agenda for increasing caring.

- A change from a national or parochial viewpoint and loyalty, to that of a global viewpoint and loyalty.

- A change from emphasizing the private benefits of learning, to emphasizing the public benefits of learning. We need to develop a sense of service and to stress community benefit and the advancement of public good.

(e) a recommitment to the goal that education must be for all and not just for some.

(f) a commitment to learning how to learn, and to develop a love of learning, in order to provide the basic building blocks for lifelong learning. This involves the development of the ability to critically assess one's own learning.

(g) a third "passport" of learning, namely, the enterprise passport. This involves elevating enterprise education to the status currently enjoyed by the academic and vocational education passports. Enterprise education involves nourishing the capabilities of thinking, planning, co-operating, communicating, organizing, solving problems, monitoring, and assessing.

(h) an emphasis on personal development, self-awareness and esteem, and confidence, in order to deal with a rapidly changing world. The development of a positive outlook to the future so that we will be empowered to create a preferred future.

(i) a commitment to promoting interpersonal development, supporting the ability of young people to develop relationships with others. The promotion of tolerance, and respect for different views and perspectives, cultures, religions and races, and towards the opposite sex, and to disabled people.

While maintaining cultural identity and values, a philosophical approach to education for the twenty-first century will need to emphasize a commitment to co-operative globalism. This will be an outcome of developing cultures with greater caring capabilities. Indeed, we need to create a new paradigm for co-operative globalism. The creation of such a paradigm is an urgent task. Both economic and ecological forces are driving the world in this direction. Even though there are increased signs of nationalist intolerance appearing around the globe, the forces driving globalism should prevail over such divisions. It should be a task of the education systems of the world to ensure that, indeed, this actually happens. One of the issues which needs to be addressed is the development of an international language for such a global society, which reinforces and promotes an international culture. This should be a topic for future specific work by Unesco.

A new education system appropriate for the twenty-first century will need to address the economic and political system in which such an education system is sited. Recent times have seen the decline of the post Keynesian approach to the Welfare State, which, while providing increased equity, actually leads to increasing dependency and passiveness among the disadvantaged. A newer neo-conservative approach has replaced it, emphasizing individual gratification over that of the society as a whole. This has lead to increased disrespect for disadvantaged groups, and to increased division between rich and poor. We need a new approach based on care for all and which emphasizes the realisation of social justice goals through the empowerment of disadvantaged people to enable them to actively seek solutions to their economic problems, through enterprising and innovative behaviour.

2. RUSHING TOWARDS A GLOBAL SOCIETY

Globalisation has been under way for some decades. It has been largely driven by forces of economic rationalism. A major product of these changes will be the formation of a single economic unit in Europe in 1992. In addition, however, ecological forces have generated considerable global fear that our fundamental life-support systems are in danger. The 1987 report of the World Commission on Environment and Development, "Our Common Future", (the Brundtland Report) has given the earth a new agenda for action. We need to create an ecologically sustainable world within a generation at the outside. By the year 2010 our agriculture, fisheries and forestry, and indeed all forms of development need to become sustainable. Even though we do not know what this sustainability will precisely look like, we need to commit ourselves to realizing it. This will require many changes, including new forms of land management, the creation of new products, services and technologies, new

forms of consumer behaviour, and the addressing in particular of third-world debt problems so that developing countries will be able to afford to be part of the solution rather than part of the problem. The education system needs to address the fundamental issue of creating sustainable development. This is a positive way of dealing with a series of problems which are usually portrayed in a disempowering and negative way. We need to be able to understand the nature of the issues through scientific and other forms of knowledge, but we should also develop a commitment to caring for the earth, and to regard ourselves as integral parts of the environment and not separate from it. In the twenty-first century, people will need to give their first loyalty to the ecological environment of the planet. Unesco will need to address in detail this new agenda.

Among the issues which need to be addressed is a commitment of all people towards solving these problems in a co-operative and equitable way. This means that developed countries will need to provide developing countries and disadvantaged indigenous peoples everywhere with considerably greater levels of financial and technical assistance. People will need to care more for this to happen. In addition, people will need to recognise that other species on the earth have a right to exist, and that the solution of human problems should not be gained by sacrificing other species.

3. DEVELOPING A NEW VIEW OF LEARNING FOR THE TWENTY-FIRST CENTURY

The system of institutions which will engender the most appropriate learning for the twenty-first century will need to be quite different from present models. Possibly the most important ingredient will be the increased involvement of the community in schooling, and an increased involvement of the school in the community.

As learning will be a lifelong process we need to better use all learning opportunities. Learning within the family context, from peers, from the community including via the media, and by other means, are every bit as important as learning engendered by the school. Increasingly, learning is done outside the school.

Learning also needs to be increasingly learner-initiated and learner-driven. Educational technology is providing new opportunities for high quality interactive learner-driven learning. We can expect this to increase dramatically in the 1990s. Indeed, because of advances in educational technology, it is now possible to be a lifelong learner even if one is illiterate.

The traditional view of education has been based on a view of learning, where teachers and texts are the source of knowledge and students the passive recipients. The enterprise educational passport requires active participation by the learner. Another way of expressing this view is that learning must be based on the traditional curiosity, activity and innovativeness of early childhood.

Learning should be an interactive process based on initiating motivated learners. This requires an active learning process, involving organizing knowledge, integrating this with what one already knows, and using this knowledge in solving real problems. In short, learning should be focussed on what learners can do, rather than what they know. Learning should be an empowering process, and lead to positive action, and to creating a preferred future.

To encourage such interactive learning, learning environments need to be restructured so as to encourage and include:

- Respecting what the student brings as a resource to the learning situation
- Student goal-setting

- Problem-oriented learning
- Learning to be enterprising
- Learning to be collaborative
- Widespread use of educational technologies utilising interactive learning
- Teachers playing the role of the facilitators of learning instead of being sources of knowledge

Learners need to become anticipatory in dealing with future issues, and to be able to develop visions so they can set out desirable goals for themselves and for society. A learning society, full of learning organizations and individuals, will be both anticipatory and participatory.

The requirement for lifelong learning and education will mean that education systems will need to find new partners in the education process. No longer can schools be places where students are prepared for everything in life. Indeed, lifelong education means that schools can be relieved of the onerous duty of programming people for life. The old division of lives into three parts, namely, schooling, work and retirement is disappearing. In the future education, work and leisure will occupy the whole of life and only change in their relative proportions. School now needs to engender enthusiasm for learning, and to give students the tools to become lifelong learners. Provided society offers many opportunities for learning in later life, people will be able to acquire the knowledge and skill needed for living and adapting in a rapidly changing and complex world. In such an educational system, technological redundancy should become a thing of the past. Even the disappearance of whole job categories, and the creation of new ones should not be a major threat.

The new partners that the education systems should seek include the following:

(a) The development of national approaches which recognize the educating role of parents in early childhood, and which allow parents to continue their involvement by actively participating in the early years of schooling. This should allow additional resources to be provided in the school system and will result in the development of co-operative arrangements for the promotion of appropriate social attitudes in the young.

(b) An increased integration between the school and the world of work. Students should become involved from an early age in the world of work. This will require new forms of co-operation between employers and the world of work on the one hand, and the education system on the other. It is important to recognize that the future world of work might differ dramatically from the present world of work. Indeed, educational planners should seek to encourage associations with work places which are likely to be characteristic of future work arrangements, rather than present ones.

(c) A more coordinated approach between the print and electronic media and educational institutions to the promotion of learning. The media already is a major promoter of learning, a great deal of which is in some countries, probably undesirable and threatening to longer-term human welfare. The media needs to assume greater responsibility for its role in the learning process, even this will to some extent conflict with current concepts relating to freedom of the press. Educators need to fully recognize the potential role that the mass media can play in public education, and should seek to integrate their educational programmes, where possible, with media organizations and their programmes.

LEARNING TO CARE: EDUCATION FOR THE TWENTY-FIRST CENTURY

REPORT OF THE SYMPOSIUM

"The future is not some place we are going to, it is one we are creating. The paths to it are not found but made, and the making of those pathways changes both the maker and the destination" (Anon)

The discussion in the Round Table painted a view of the future which needs to be taken into account in making decisions about education for the twenty first century. It is a future with a range of challenges including the ecological problems facing the world, the world population growth, and the growing economic divide between rich and poor nations. At the same time, there are reasons for hope. The policy of demilitarization currently just beginning could enable investments to be channelled into meeting basic human needs, dealing with urgent environmental problems and reducing the debt of poorer countries. Furthermore, there are major technological changes which, if managed appropriately, have great potential for wealth creation around the world.

This report will consider the implications for education for the twenty-first century which takes these challenges into account. In setting forth these implications, the Symposium's perspective was that of the learning capacity of societies in its broadest sense. That will require that almost every societal institution consider its responsibility and role in the learning process. This requires also that, using a systems approach, there will need to be many more collaborative partnerships in order to broaden, enhance and accelerate learning. Those directly responsible for educational planning and administration as well as teachers should regard themselves as animators and coordinators of such partnerships. This will strengthen the human capacity to master the processes of change for the better destiny of humankind.

CULTURAL, MORAL AND ETHICAL ISSUES

What are the distinctive cultural, moral and ethical issues which this new scenario will require us to consider?

(a) Hopefully, further reduction of arms will continue. (Moreover, nations not involved in the major blocks also need to be willing to divert resources from military budgets to meeting basic human needs and to safeguard peace). All countries may need to consider what effective peace education would be for children and young people in schools, non-formal, informal, and lifelong education.

(b) The current trends towards democratization in the world will hopefully promote better understanding between nations. In order to support such a change we will need an education which enables us to live in a plural world, both between countries and within countries, with mutual understanding and respect. We will be living in a plural and highly interactive society and it will be important to acknowledge and respect the views of others different to our own.

(c) The global problems we face with the environment will require a new ethic of responsibility and trusteeship for life, now and in the future. Rather than controlling the environment, we will have to learn to live in harmony with it as an integral part.

(d) Human rights and dignity must still be an issue at the forefront of our concerns but will need to be extended so as to encompass a wider ethic requiring respect for all life forms.

(e) The technological developments taking place in many parts of the world are producing changes in people's work and living conditions. In the developing countries they have lead to materialistic tendencies and the erosion of traditional cultural values. Within the developed countries, this has produced an increase in material prosperity, but is bringing some negative effects in terms of the cohesion of the society. Prosperity does not necessarily lead to an improved quality of life. The new technologies are also generating new ethical challenges and dilemmas (e.g. new reproductive technology) which will require careful consideration.

(f) The gap between rich and poor nations is increasing. It will be necessary for the richer nations to realize the threat that such a divide will pose to stability in the future and appreciate the need to redress the balance.

(g) While it was accepted by participants that a goal of education is to enhance young people's love of their country, this is not to be interpreted as the same as teaching an unquestioning support for a particular social system.

What implications does this have for education?

A Convention on the Rights of the Child was adopted by the United Nations in November 1989. In all societies the right of the child to education, health, shelter, care and protection against all forms of abuse and exploitation needs to be kept to the fore. In considering children's moral and ethical development, it is necessary to reflect on the way that we as humans develop attitudes to ourselves and to the world around us. We know that it is important for a child to establish a positive attitude to itself and its place in the world during the early years of life in order to develop a positive self-concept; positive relationships with carers during this period are very important.

Along with the emergence of self-concept, basic attitudes such as trust, hope, love, respect, optimism, nutured during infancy, may also lay the foundation for personality development essential for later stages in life and important for the establishment of caring attitudes for others.

The development of self-esteem is important before children can venture into the world with confidence and develop a caring attitudes to others. A positive self-image is important for moral development and ethical development. School alone cannot influence moral/ethical development. The family must be involved as well as society. In the family situation the basic building blocks for a caring character are formed. These include trust, hope, love, respect, and optimism. In present day societies, with their emphasis on scientific rationality and exploitation of the world, there is a tendency for people to enhance their sense of self through competition with others. In a world where mutual respect and co operation is essential, it will be important to develop environments, at home, school and in wider society, in which young people's self-esteem is enhanced through supporting and co operating with others rather than through competition.

Directions which will be helpful to implement this may include:

(a) Support by society for the carers of children and counselling during their early years. This may include parent education and enabling parents or those with the primary care for young children to have adequate time to spend building sound relationships with them.

(b) In societies where parents, due to work obligations, have less time at home, schools are being expected to shoulder the responsibility for children's moral development. However, development of this kind occurs through experience within an environment and formal teaching cannot succeed by itself. There will need to be a partnership with other agencies in society including politicians and the media to address this issue.

(c) Schools, as social institutions, may need to rethink the way they are structured. At present they tend to be based on a nineteenth century hierarchical scientific management model: the superintendent is the manager, the teacher is the worker and the student is the product. Other organizational models for schools may need to be considered if students' development as whole persons is to be enhanced. Rather than considering how to prepare young people for the future, we need to think about preparing for the future with the help of young people through their active participation in and involvement with constructive and co-operative educational environments.

(d) In the classroom a "pedagogy of democratic fellowship" can be created in which children collaborate and support each other in their learning. Such classrooms can be mini social realities in which students assume different roles including those of leadership. Teachers are facilitators, organizers and managers of the learning - in this way, they focus not so much on what they are to teach but on supporting their students' learning. In this way, values are imparted through action and interpersonal behaviour in the classroom.

(e) For adults, there are many conflicts, tensions, contradictions and double standards in their lives. There is thus a role for adult education which will emphasize value clarification, problem solving, and address the conflicting issues in their life. Non-formal education can complement and enhance the formal system in this case.

SCIENCE AND TECHNOLOGY

The society of the twenty-first century will require a scientific and technological base among its citizens but questions need to be asked about what kind of science and what kind of technology education will be needed.

Furthermore, art and design is also being seen as having an important place along side science and technology education in the future. Not only do all three activities require creative qualities but art and design have an important contribution to make along with science in the development of technological products.

In many school science programmes, the rationalist view has portrayed science as embodying objective truth and as value free. This view of science is now being criticized. Science is now being recognized as a human pursuit and an integral part of each culture. It requires creativity in the generation of ideas and ingenuity in testing and evaluating them. Furthermore, scientific theories have changed and evolved over the centuries and they are likely to continue to do so in the future. In reflecting this more humanistic view of science in teaching, it is important to portray the controversies, conflicts and social contexts which determine how ideas have become accepted. In this way, students may better appreciate the status of scientific ideas and understand the way science itself proceeds.

A number of issues for the teaching and learning of science will need consideration:

(a) All students at school should have exposure to science education. However, school science is often divorced from people's everyday understandings. As a result, what is learnt in school is forgotten once examinations have been taken - the learning does not carry over to people's daily lives. If the contexts chosen for science work can

draw more on people's daily life experience and their own ideas, then it is more likely that this gap can be bridged. Teaching the science involved in the working of everyday devices, such as farm tools, may be helpful in this respect as well as not requiring expensive laboratory provision. However, low-cost science equipment will still be required to meet the needs of developing countries.

(b) In school science courses more emphasis will need to be placed on science as enquiry, as an exciting way of finding out about the world, rather than as a body of knowledge. We need to teach less but teach it more effectively. The local environment should become the laboratory of education, not only in the study of science, but in other areas, such as history and the social sciences.

(c) Science courses should give students the opportunity to consider the social, economic and ecological impact of scientific and technological innovations.

(d) Environmental science will have an important place in helping young people appreciate the interdependence of living things and the fragile balances in the biosphere. For this locally based case studies would be appropriate and are most likely to stimulate the interest of students.

(e) The flavour of science as a human pursuit can be given through students' own enquiries. By developing testing and comparing ideas within a group, students can realize that others may have different ideas to their own and can appreciate the way science itself proceeds. Studies of the way scientific ideas have changed over the times, how different societies have developed different theories, and how scientific controversies have occurred may help students to further appreciate the tentative nature of scientific knowledge.

(f) Equality of opportunity is central to our concerns. It is well known that in most countries present curricula and teaching methods result in girls achieving less well on physical science courses than boys. The orientation towards the science taught, the way it is presented and the methods of teaching will need to be reviewed to address this problem. The teaching of science to girls as well as boys should be seen in the context of career guidance and counselling in order that equality of opportunity between men and women can be realized in education and training.

(g) In many countries the quality of science taught at the primary level is poor. This is largely due to the low level of scientific education of teachers. This is a long-term problem and needs to be addressed by specific programmes.

Our view of technology may also require reframing. There is a tendency for technologies to be viewed as ways of exploiting and controlling the environment to specific ends. In the future, technologies will continue to need to be developed which meet basic human needs in ways which are appropriate to each culture. Now, with our recognition of factors such as the limited physical resources of the earth and the delicate balance that needs to be maintained in the biosphere, we can no longer afford to neglect the various side effects that a technological innovation may have. There will always be costs as well as benefits to be considered as a result of any new technological innovation. Additionally, the role of technology in helping to solve environmental problems needs to be studied.

In a sustainable world there will be need for technological developments and enterprise, not only of a high technology nature, but low-cost intermediate technologies will be required. Technology teaching tends to be undervalued compared with science teaching. We suggest that, if we are to develop enterprising students, there may be a case for technology to have a more prominent place in the curriculum.

Technology courses are being implemented in schools in a number of countries. These give students the opportunity to design, construct and evaluate devices or systems which can be

chosen to address needs in the students' own environment. In developing and evaluating products in this way, students can also be given the opportunity to consider the costs and benefits of the innovation and hence see the activity in social and environmental terms.

Such a problem solving approach has particular relevance for some adult education work. For example, in rural communities people may identify and work on a common problem e.g. improving their water storage system or the quality of animal feed.

COMMUNICATION

Communication means by definition to do something together with others. It is a basic human need. Without it we die psychologically as human beings. Language is of course the most powerful form of communication we have. It enables us to not only to communicate with others but to represent our own thoughts to ourselves and so develop and articulate them. Language is not our only means of communication, however - as humans we communicate through gesture, clothes, music and art.

1. Languages and language teaching

A policy for the teaching of languages is needed both to enable people with different mother tongues within a country to communicate and participate in that society and to provide for foreign language teaching to be a high priority in the progressively interconnected world of the twenty-first century. A case for a world language was considered at the symposium, and it was recognized that, with mass communications now operating on a global scale, there is a real possibility of the English language becoming progressively dominant. However, the importance of preserving the rich cultural heritages embodied in the world's variety of languages was recognized as being essential.

In considering language education for the twenty-first century the following points were made:

(a) Mother tongue, or the language of the home should be used in the beginning years of schooling where possible. Reading and writing skills in the mother tongue can later be built on in the context of lifelong education. However, countries will need to decide their own language policies in conformity with their national objectives.

(b) Foreign languages in schools will require greater attention. This can be provided by teaching entire school subjects in the foreign language and by developing bilingual or total emersion schools. Teachers also need to be knowledgeable about different cultures and cultural implications in addition to the language itself.

(c) There may need to be different foreign language programmes for groups with different needs e.g. foreign language suitable for skilled workers in a mobile workforce or for academics in specific disciplines.

(d) Systems should be considered in which language minorities can profit educationally from knowing another language rather than being penalized as at present tends to happen within centralized education systems.

(e) The variety of languages taught in schools may need to increase with for example the inclusion of major oriental languages to enhance intercontinental communication.

(f) Exchanges of both pupils and teachers between countries could greatly benefit foreign language programmes.

(g) Artificial languages including computer programming need to be considered within a language policy.

2. Communication within the learning process

Technical developments in the communication area have made enormous progress in the last decades. From a psychological point of view, personal communication, that is direct interaction with the teacher, has proved to be the most efficient educationally. We cannot and should not replace the teacher. However, we can and must improve the quality of teaching. Attention must be paid to teacher training programmes to adapt them to an ever-changing society. Teachers also need an increased understanding of their role by the public.

The quality of education depends partly on the quality of communication in a social network; teacher-student, teacher-family, teacher-peers, teacher-communities. We have a body of knowledge now regarding the "communication chain" (sender, message, receiver) but, in order to create a more caring society in the future, we need to increase our knowledge of the psychology of the receiver. We need to know how we are perceived as senders as well as how our message is received and interpreted. We know that men and women may communicate differently and "male language" and "female language" may be characterized by a variety of aspects. Communication in different cultures varies as in different subcultures within the very same country.

Teachers need a increased knowledge about communication and human relationships in their teacher training programmes. A teacher's professional attitude contains at least three essential ingredients: knowledge, self-awareness and empathy. The latter two are most difficult to implement in a teacher training programme; they cannot be taught, only experienced and communicated through, for example, supervision.

Increased communication is needed between teacher, other professional personnel in the school and peer groups. Social learning (human relationship skills, values, attitudes, etc.) can be stimulated and facilitated in peer groups, provided that teachers and other professionals can offer support and supervision.

Educational evaluation is also part of a communication process. Evaluation of educational programmes and students' learning outcomes is necessary to provide information and feedback in order to guide decision making in educational administration and instruction. Any evaluation study needs to consider what it is that is to be evaluated, how it should be evaluated, who should be involved in the evaluation, and who requires the information. It is recognized that the type of assessments used in schools have a strong influence on what students see as being important to learn. If we are to promote a greater emphasis on encouraging the students to become active learners, to be enterprising and inventive problem-solvers, then this will require a major shift away from the assessment of memorized facts towards the assessment of processes. The development of appropriate assessment procedures will need to be an important priority.

3. Information technology and new communications systems

New developments in information technology, including computer aided learning, interactive video, video and television, offer important opportunities to improve the quality of learning for many students. Developments in this area, however, require a large investment of effort and finance. In many developing countries the reality is that only a few elite schools would have such technology, thus aggravating the equity problem in developing countries. In order to enable the maximum benefit to be obtained from these developments, the following will need serious consideration:

(a) Research into ways of reducing significantly the costs of necessary equipment.

(b) The setting up of centres, national, regional and global, to produce and evaluate new resources and media and to train trainers in their use.

(c) The provision of satellite channels for use by developing countries for educational television.

(d) The international exchange of educational television programmes.

There is an important role that can be played by international agencies in developing distance learning materials which address global concerns such as pollution, the greenhouse effect, population planning, etc.

The effectiveness of pedagogy based on new information technology has yet to be evaluated. There is a clear need for research to guide innovations and use of this technology both in school and in out-of-school settings.

Distance education will undoubtedly be greatly expanded, especially in developing countries. If this development is to be most effective, it will be necessary to consider the support needed to provide quality programmes and, more importantly, to organize learning experiences through distance education that will involve two-way rather than one-way learning activities.

4. Education and the mass media

A new strategy of education based on innovation should be adopted in all countries; self teaching should be considered an important element in such a strategy. Educators have a part to play in ensuring the flow of relevant information through the media. They may need to assess the access to mass information through various media by different segments of the population and to assess and influence its quality. This may involve:

(a) Contact with groups involved in the field of communication (including the mass media, religious leaders, folk and pop media).

(b) Provision of technical support to improve the quality of information, in particular, giving support to indigenous learning networks on which new activities can be grafted, thus enhancing their role as communication networks for communication and development.

(c) In countries where the media are controlled by commercial interests, governments may need to invest in creating the necessary public service, educational media infrastructure, radio, television, etc.

(d) Encouraging the involvement of people in local programmes, grass roots publications, etc. so that people will not be passive recipients but can generate information and share it with others.

THE WORLD OF WORK

It is difficult to generalize about possible or probable future educational needs for the work force in the twenty-first century.

For example, those needs will differ greatly between rural areas of developing countries and advanced technology areas in the developed countries.

However, it is still possible to propose some likely characteristics of twenty first century work places and the educational qualities which will be needed to effectively work in them.

1. All members of the work force should have access to lifelong learning opportunities, and where possible, career-path planning programmes also. Workers will need to accept responsibility for planning their own workplace education programmes. They will need to be active, flexible and adaptable initiators, rather than passive takers of orders. Loyalty to the work organization will continue to be important. A significant number will also need to be effective entrepreneurs, as a large proportion of workers will need to be able to create their own work opportunities.

2. Rapid technological change will continue, and almost certainly accelerate. There will be large changes in job categories, with possibly fifty percent of job categories changing in one generation. In addition, skills will need to be renewed at the rate of approximately fifty percent every three-five years. Technology will also continue to play a role in broadening the nature of work, requiring increased multiple skilling.

3. Educational services in the work place will continue to receive an increasingly larger proportion of financial resources. The greater the skill level and knowledge required in work, the higher will be the proportion of total resources needed for effective workplace education. In advanced technology areas a significant percent of total resources devoted to workforce education will be common. In rural areas of developing countries, significant workforce education programmes will also be necessary, with an emphasis on technical and management skills.

4. Education for the workplace of the twenty-first century will need to be broadly based during the early years. One way of creating a flexible workforce for the twenty first century will be to continue the broad general education currently characteristic of primary school education in most countries. This should be continued and general education should extend at least into the early years of secondary education. Primary school students need to be introduced to the concepts related to the world of work at an early age so that they can understand the role of work in our socio economic system. The point of time when vocational education should be introduced into the educational system will depend greatly on the stage of development and the economic structure of the country or region involved.

5. Three types of educational requirements should be part of education for the twenty-first century workplace. While the importance of academic and vocational capabilities is well known, this is not true of the enterprise capability. The enterprise skills of thinking, planning, communicating, organizing, problem solving, monitoring, and assessing will all dramatically increase the effectiveness of a worker and the fulfilment he/she derives from work. Indeed the first two capabilities could be of dubious value without the third. Unlike the other two capabilities, the enterprise category needs to be learnt virutally entirely by doing, rather than listening. Therefore, a change in the way learning is achieved will be necessary.

6. Many developing countries need to develop education systems to reinforce rural development programmes. Rural economic development and related education programmes need to be planned together. Rural-urban migration is continuing to increase at a high rate. Educational programmes which are designed to create a stable and developing economic base in rural areas need to be created if this migration tide is to be successfully stemmed. Many developing countries find it difficult to provide sufficient farm lands, jobs and services in rural areas in order to maintain population in those areas, while at the same time attending to the needs of recent urban migrants.

7. Most work places function in a highly competitive environment. Economic success is achieved by work places which maximize internal co-operation, while maximizing the external competitive edge. Co-operativeness in the work place will be an essential ingredient of twenty-first century work places.

8. Some developing countries have introduced a concept of non-military national service. This encourages young people to provide services to their communities and nations at several stages during and after their formal education. This process is also a very effective introduction to the world of work, the development of work ethics and encourages the commitment to public service. Countries which are not yet using such a system may wish to contemplate developing it.

9. Increasingly, work places are being managed in ways which maximize workplace learning. They are being managed so they will finish up with knowledge and skill advantages in future years. Workers are likely to choose workplaces which offer greater learning opportunities rather than greater financial remuneration. Workplaces which offer the best educational learning opportunities will tend to keep the most able and dedicated workers.

10. Ultimately, the most successful worker in the twenty-first century will be the person who has the most balanced personal development, and who is open to new ideas and new opportunities. Any attempt to focus workforce education programmes on narrow work skilling, while they might produce some short term gains, will produce significant structural long term problems. The cost will be an inflexible non-learning labour market, which is highly vulnerable to rapid, unpredictable change.

RECOMMENDATIONS

The Symposium and Round Table requests that:

1. International agencies and associations concerned with education should consider preparing curricula guidelines for those issues which are of global significance. These include:

   - issues relating to the state of the global environment, including the implementation of the report of the World Commission on Environment and Development, "Our Common Future" (The Brundtland Report).

   - Global economic issues such as developing country debt, international drug trafficking, and the development of regional economic arrangements, such as Western Europe post-1992.

2. Unesco and Member States should identify the research areas which have been identified by the Symposium and Round Table as issues related to education for the twenty-first century, and for which further information and analyses are required.

3. Unesco should consider establishing a new international commission on the lines of the Commission "Learning to Be". This new Commission would further develop the work of this Round Table and Symposium, "Learning to Care: Education for the Twenty-First Century".

4. Unesco reaffirm its stated goal of seeking to achieve worldwide and full access to basic education by the Year 2000.

5. Unesco and all Member States work to dramatically improve the employment conditions of teachers, in order to ensure the development of a stable, high quality teaching profession.

6. Unesco and Member States develop appropriate new education methodologies in order to assess the capabilities of actively and interactively learning students, to replace assessment systems based on the memorisation of taught knowledge.

7. Unesco should appeal to Member States to ensure that at least ten percent of revenue redirected from military budgets resulting from the end of the Cold War, and the development of East-West detente, be directed to the education area, especially the promotion of literacy. Developing countries similarly realign their budgets.

8. Unesco and Member States should develop programmes in the education system focused on the maintenance and protection of human rights, so the twenty-first century leaders are more respectful of and more sensitive to this issue than many current leaders.

9. Unesco and Member States should recognize that the development of co-operative regionalism and globalism will still require attention to significant levels of autonomy at the local level. The development of a global society should not undermine maximum possible local management control within the constraints set by the demands of global co operation.

10. The Symposium and Round Table request Unesco and Member States to increase the resources made available for these purposes.

Annex 1

OPENING SPEECH

International Symposium and Round Table

"Qualities Required of Education Today to Meet Foreseeable Demands in the Twenty-First Century"

Li Tieying
State Councillor

27 November 1989

Mr. Colin N. Power, Assistant Director-General for Education, Fellow Delegates and Observers, Ladies and Gentlemen,

The long-awaited international symposium on education in the twenty-first century opens today. Allow me, on behalf of the Chinese government and in my own name, to express my warmest greetings to delegates of Member States, observers of United Nations organizations, and all friends, and express the wish that the symposium and round table be crowned with success.

Ladies and gentlemen, the fact that our symposium on qualities required of education today for the twenty-first century is being held at a time when the human race is entering the last decade of the 20th century is proof of Unesco's foresight and sagacity. The symposium will take the form of a round table and seminars at which statesmen, economists, eminent personnel in scientific, technological and socio-cultural circles will gather together for discussions. This will ensure that the debate on education in the twenty-first century will be of the highest level. I am confident that the present symposium will exert a positive influence on the educational development of Member States and Unesco's activities in the field of education.

Education is an enterprise for the future. Today's university students, secondary school students and primary pupils will constitute the driving force in all fields in the twenty-first century. Their qualities, fostered through various forms of education, are likely to influence the first decades of the twenty-first century. People in educational circles must, therefore, show more concern about the twenty-first century and shoulder more responsibilities. The symposium will discuss "qualities required of education today to meet foreseeable demands in the twenty-first century", which is already a realistic theme of great importance.

We are now entering into the twenty-first century. The challenge education faces is tough and global. Therefore, the mission of education will be both arduous and glorious. Whoever grasps twenty-first century education will hold the initiative in that epoch. The concept of education will be further renewed. Education will be lifelong; it will be something to which society as a whole pays attention; the structure of education will become varied and more flexible, education forming a crisscross network embracing society in its totality; education will become the strategic focal point in promoting the economic and social development of various countries so that they will be able to take their place among the nations of the world. Exchange, cooperation and emulation in education amongst countries increases daily and, at the same time, is becoming an indispensable part of educational development and reform in all countries.

Ladies and gentlemen,

You may have followed with interest the course of education in China, a country with one fifth of the world's population, and the way in which our country has met the challenge of the twenty-first century. Over the past forty years, education in our country, just as our people's republic, has experienced the tortuous road of struggle and exploration. In the process we have also made continuous progress. We have established New China's socialist educational system which embodies the principle of educational equality; we expounded a series of policies whereby "Education must be geared to modernization, to the world and to the future", "Education must serve socialist construction and socialist construction must rely on education", "Education must be combined with productive labour". The structure of China's education is constantly readjusted according to the demands of economy and social development and will therefore become increasingly rational. Thanks to the great efforts of the past forty years, the percentage of illiterates in the population has decreased from over 80% to 20.6%. We have set up the largest educational system in the world. There are 10 million university, secondary and primary school teachers and the number of people receiving formal schooling has reached 200 million. In the past forty years we have trained for industry, enterprises, offices and the rural areas 22 million specialized personnel, and billions of workers now have an educational background. China's achievements in socialist construction would have been impossible without the progress of New China's educational undertakings, its trained specialised personnel and workers. These achievements form a base upon which our confidence in the future and our work towards the twenty-first century can be built. Needless to say, there have been errors, and we are confronted with problems and difficulties. But more important, in the past few years these problems and difficulties have been placed on the agenda of the Party and the Government. Solutions have been found for some, whilst others are still in the process of being solved. As of last spring, a special committee organized by the State Council, consisting of the departments and commissions concerned has been drafting a programme for educational development in China up to the year 2000. The National Centre for Educational Development Research undertakes research into medium- and long-term development strategies as the focal point for its work.

China has formulated a three-phase strategic plan of economic construction for socialist modernization. The first step is to double the GNP of 1980 and solve the problem of food and clothing for our people. The second step is to double it once more by the end of this century, thus enabling our people to lead a comfortable life. The third step is to reach the per-capita GNP of moderately developed countries by the middle of the next century. This will signify that our modernization has been basically accomplished and our people have begun to enjoy a relatively affluent life. Then, China will continue to advance on this basis. Throughout this process, the development of education will be given strategic priority. Economic growth will be gradually switched to dependence on scientific and technological progress and continuous rise of productivity. Educational development strategies will constitute an important part of China's general development strategy and the realization of the overall strategic plan.

I believe that the research on development strategies for China's education, the reform of educational structures and innovative content and methods in education will draw both inspiration and learn lessons from this symposium. In concluding my speech, I would like once more to express my warm welcome and my thanks to the delegates, Mr. Power, Assistant Director-General and his colleagues.

Annex 2

ADDRESS

International Symposium and Round Table

"Qualities Required of Education Today to Meet Foreseeable Demands in the Twenty-First Century"

Dr. Colin N. Power
Assistant Director-General for Education
Unesco

27 November 1989

Ladies and Gentlemen,

It's a great honour and pleasure that the Unesco International Symposium and Round Table "Qualities Required of Education Today to Meet Foreseeable Demands in the Twenty-First Century", being graciously hosted by the People's Republic of China, opens today in Xiangshan Hotel in the Xiangshan park, Beijing. On behalf of the Director-General of Unesco and on my behalf, I am happy to welcome all of you to this meeting.

I should like to express our gratitude to you, specialists from different backgrounds, for taking on the debate on the future goals of education and the qualitative requirements of education if it is to help young people to meet their personal, social needs as well as societal needs of the Twenty-First Century. By inviting you to actively participate in the debate on the future conception of education, Unesco wishes to learn and obtain from you suggestions on forward-looking goals, insights and directions of education, in order to shed fresh light on Unesco's Major Programme Area I - Education and the Future, which was approved a few weeks ago by the Twenty-fifth session of the General Conference.

Debates have recently been reopened and intensified on how education should be re-oriented and on its more dynamic conceptions and roles, with a view to improving the quality and relevance of education, in order to prepare young people towards the Twenty-First Century. Young people are energetic, idealistic and full of potential skills and talents and attitudes which will serve their means to face future challenges. Their strive for excellence and competence will create a force to change and shape the Twenty-First Century. Let us maintain a dialogue with them, try to understand each other and respect them, so that they will do the same with us and understand the wisdom and experiences of adult and older generations.

The participants in the Round Table, who are multidisciplinary specialists in such disciplines as science, economics, sociology, philosophy, psychology, etc., are invited today to debate long-term goals of general education and to tell us what education must do in order to prepare young people for their active and constructive participation in their personal, social and occupational life in the next century. We would appreciate

your drawing attention to the wide socio-economic, socio-cultural realities and the challenges which must be faced by education from now towards the Twenty-First Century. How can education be re-oriented and vitalized to attract and convince young people of the worthiness of its goals, processes and outcomes? What are the necessary skills, knowledge, attitudes and values which education can persuade young people to learn and maintain? How should young people be guided in order to cope with the continuing information explosion, and with the serious deterioration of our physical environments? How could they be assisted in learning the meaning of international cooperation, effective intercultural communication and human relationships? In addition to the acquisition of knowledge and thinking processes, how could education promote humanistic and effective learning to develop a balanced personality, sensitivity, love and compassion towards other people and to deepen their understanding and appreciation of different cultures, beliefs and values, whilst sharpening their own cultural identify? I am sure that there are many other important questions, which are of equal importance, to be explored with regard to the goals of education.

The Symposium will have its own participants who are mostly educators, as well as those of the Round Table, thus permitting interactive discussions between education specialists and specialists of other multi-disciplinary fields. The Symposium will focus its discussion mainly on the qualities of education, by taking into account socio-economic and socio-cultural forces such as value orientation and its implications for education, scientific and technological progress, communication and information and the future world of work. May I remind you that our main focus in the Symposium is general education and its teaching-learning environments, dealing with such things as qualitative educational goals, educational contents and methods, learning assessment and teacher education. As you have already noted in the Discussion Guide, we shall not discuss planning and financial aspects of education nor higher education or literacy, which will be fully examined by other Unesco meetings and programmes.

It will not, of course, be possible, in the next few days, to cover all the dimensions of the qualities of education, nor will it be possible to examine specific modalities or courses of action associated with the qualities of education required towards the Twenty-First Century. May I therefore ask you to kindly concentrate your debate on the main qualitative goals of education, and their requirements in order for young people to effectively and meaningfully cope with their future today and towards the new century?

The results of the present meeting, particularly your comments and suggestions on the qualitative improvements of the educational process will be fully taken into consideration in implementing the activities of Unesco's Medium Term Plan (1990-1995), Major Programme Area I - Education and the Future, particularly its programme "Education for the Twenty-First Century"; The overall objective of the programme is to launch action for improving the quality and relevant of education, which is exactly the main theme of our meeting.

The kind of values and attitudes, either universal or culture-specific, which you think desirable for young people to understand and learn and their educational implications will fit into Unesco's programmes designed to enhance the humanistic, cultural and international dimensions of education within the framework of the afore-mentioned programme.

The suggestions on the socio-economic and socio-cultural implications of education will be useful in implementing Unesco's programme dealing with education for the quality of life, including the prevention of AIDS and drug abuse.

The world of work and education is another area to which your deliberations could contribute. What should be the role of education, both formal, non-formal and informal, in preparing young people for their active and instructive occupational role? How could education, particularly school education effectively interact with the world of work, i.e. enterprises, business, social institutions etc. in order for both parties to learn and benefit from each other as much as possible?

How should continued education and training for young people be maintained in order to enable them constantly to update and renew their skills and knowledge so that they can cope with a rapidly changing occupational world or structural changes in the economy?

The value of science and technology education. Nobody can deny the impact of science and technology on our daily lives. Being keenly aware of the importance of the notion and its implications, Unesco has been attempting to bring science and technology close to daily life situations. These efforts will continue and will be strengthened in Unesco's future programmes in this domain. There are also pedagogical implications of science and technology education. There seems to be some important attitudes and orientations in science and technology from which the learner can benefit. The values of a scientific approach, learning by discovery, systematic inquiry, intellectual curiosity for the unknown - all these cognitive dimensions of learning could be more effectively combined with the affective domain of education, dealing with values, attitudes, feelings, etc. The learner may also benefit from science and technology for knowing himself/herself more scientifically, about his/her body and psychology. Medical and health education can be reinforced in order to promote self-managed physical fitness, the maintenance of good health. Research findings derived from neuro and cognitive sciences could be translated into the curriculum context (e.g. biology) and into the social science subjects of the teacher training programme.

Finally, dealing with information and communication, the most effective introduction of technology in this field could be explored with clearly defined purposes for its use and applications. Learners should be educated not only for the effective use or manipulation of communication and information equipments, but also to be able to locate and select the necessary information and to critically assess its uses and applications.

Lastly, let me refer to some important meetings for which the results of this meeting could be taken into consideration. The World Conference on Education for All - Meeting on Basic Learning Needs, to be held in Bangkok in March 1990, dealing with the quality of primary schooling for all children and literacy linked with life skills for adults to enable them to cope with the demands of the modern world. Unesco will also organize an International Congress on Educational Planning and Administration in 1990, dealing with educational planning, policies and management.. Two regional conferences of Ministers of Education and those Responsible for Economic Planning in Africa (MINEDAF) and in the Arab States (MINEDARAB), and the fourth session of the Intergovernmental Regional Committee for the Major Project in the Field of Education in Latin America and the Caribbean (PROMEDLAC) will also be held during 1990-1991.

I hope that Unesco will learn much from your debate and exchange of opinions on the main qualitative aspects of education which faces the New Century in ten years or so. The results of this meeting will be widely disseminated by Unesco.

I thank you once again, on behalf of the Director General, for all who have provided generous help in order to make this meeting possible.

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